EIP Bulletin

TENNESSEE EMERGING INFECTIONS PROGRAM

Tennessee Department of Health Communicable and Environmental Disease Services — February 2004

Expanding FoodNet Statewide: A One-year Report

In November 2002, the Tennessee FoodNet Program implemented activities to expand active surveillance for the nine FoodNet pathogens from the laboratories in the four major metropolitan areas to include those throughout the state. To carry out this expanded surveillance, additional nursing and epidemiology staff were hired in health department regions using Bioterrorism Preparedness funds.

Orientation of these new surveillance officers to the FoodNet program took place at the central office in Nashville in the fall of 2002, and the expansion officially began on January 1, 2003. The FoodNet catchment area increased from 11 counties and 50 hospital laboratories with a population base of 2.8 million, to 95 counties and 134 hospital laboratories with a population base of 5.8 million. Every laboratory in Tennessee that does microbiologic testing for enteric pathogens is now visited monthly by a FoodNet surveillance officer and included under active surveillance.

The foundation of FoodNet is active laboratory surveillance for nine specific pathogens. There are two models used for active surveillance: In the first model, in place since 1999 and utilized in the four major metropolitan areas, surveillance officers employed by Communicable and Environmental Disease Services (CEDS) section of the Tennessee Department of Health at the state level carry out this activity. The second model is used in all

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Influenza in the United States and Tennessee

This year's influenza season arrived earlier than usual and introduced widespread infection to many areas of the country. According to Dr. Keiji Fukuda of the Centers for Disease Control and Prevention (CDC), substantial influenza activity was first reported in October, making this year the earliest onset of the influenza season since 1976. This season has been dominated by influenza type A (H3N2) viruses, which have been associated with increased morbidity and mortality in the past. Of the type A viruses submitted to CDC for analysis, 70-80 percent were the A - Fujian strain.

Influenza activity in Tennessee was first reported in the third week of November; it appears to have peaked during the last week of December. The proportion of patient visits to Tennessee influenza sentinel providers for influenza-like-illness (ILI) appears to have peaked at 4.20 percent of all visits related to ILI. In the United States, the proportion of patient visits to influenza sentinel providers for ILI overall was 7.7 percent during the last week of December, which is above the national baseline

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The **EIP Bulletin** is published two times a year by the Communicable and Environmental Disease Services section, Tennessee Department of Health, 425 5th Avenue North, Nashville TN 37247.

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Funding for the **EIP Bulletin** supplied in part by CDC Cooperative Agreement U50/CCU416123. Department of Health. Authorization No. 343320, 600 copies. This public document was promulgated at a cost of $1.07 per copy. 02/04

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other health department regions. In this model, staff members hired by those regions carry out this function. Each model has distinct advantages; both appear to function well and achieve the desired results.

A Positive Evaluation. At the completion of the first year of the statewide FoodNet program, there is firm objective and subjective evidence that the expansion has been successfully inaugurated. One objective measure of the success was to compare the completeness of FoodNet data between the established and the new models of active surveillance. Hospitalization admission and discharge data, along with patient outcome, race, gender, date of birth and status were compared. The data in both models were strikingly similar in terms of completeness.

Though FoodNet concentrates on nine specific reportable pathogens, the efforts of surveillance officers have a beneficial effect on other aspects of the notifiable disease reporting system. There is now routine, scheduled communication between hospitals and health departments; several health departments receive daily electronic laboratory reports as part of syndromic surveillance efforts begun in the bioterrorism preparedness program. There is ongoing evidence that communication between health departments and hospitals/laboratories has been strengthened and reinforced.

A Dependence Upon Colleagues. Moving statewide with FoodNet has taken place more successfully, smoothly and rapidly than we had thought possible. This could not have happened without the enthusiastic support of our colleagues in laboratories, infection control departments, and public health departments throughout the state. We extend sincere thanks for your interest and efforts in making this a success.

Influenza in the United States and Tennessee (continued)

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of 2.5 percent during influenza season. Texas and Colorado, where this season's influenza originated in the United States, reported reduced ILI office visits from influenza sentinel providers beginning in December.

Antigenic Characterization. Antigenic characterization for the United States included two influenza A(H1) viruses, 326 influenza A(H3N2) viruses, and 2 influenza B viruses. The hemagglutinin proteins of the influenza A(H1) viruses were similar antigenically to the hemagglutinin of the vaccine strain A/New Caledonia/20/99. In the United States, 75 percent of the 326 influenza A(H3N2) isolates characterized were similar to the drift variant, A/Fujian/411/2002, and 25 percent were similar antigenically to the vaccine strain A/Panama/2007/99. Both influenza B viruses identified were similar antigenically to B/Sichuan/379/99 which is in the 2003-04 influenza vaccine.

Early laboratory cultures in Tennessee included two influenza A(Unknown) and three influenza A(H3N2) in November. The totals for Tennessee through December include 76 influenza A(H3N2), 15 influenza A(Unknown), and 1 influenza B from Shelby County.

Influenza Vaccine Supply. At the start of this influenza season, vaccine supply was plentiful enough to meet typical demand. More people requested vaccination this year than previously, so for the first time the normal supplies of vaccine were nearly depleted. There are at least three major reasons why manufacturers of influenza shots have sold all of their supplies. (1) Earlier than usual outbreaks of influenza fueled a surge of vaccine orders later in the season than usual. In past seasons, manufacturers of influenza vaccine have received relatively few orders in late November and December. (2) Many public and private health providers made increasing efforts to educate the public, particularly those people at high risk for serious complications from influenza, to get a influenza vaccination. (3)The early influenza season generated news stories about the potential for this year's influenza season to be one of the most severe in the past few years. Much news coverage devoted to influenza-related deaths in children this year, has generated increased concern about influenza. In an average year, influenza kills about 36,000 people in the United States. The news coverage may have motivated people who otherwise would not have gotten influenza shots and it sustained interest in influenza shots into late December.

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Influenza in the United States and Tennessee (continued)

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Manufacturers of the influenza vaccine, like manufacturers of consumer goods, use past history of consumer demand to determine how much product to produce. This year demand exceeded their projections (i.e., about 82 million doses of the injectable vaccine). Influenza vaccine manufacturers absorb significant financial losses when they have to discard unused vaccine. In fact, this year one company is no longer producing influenza vaccine.

In 2003, an intranasal, trivalent, cold-adapted, live, attenuated vaccine, commonly referred to as FluMist®, was newly approved for use among healthy persons aged 5-49 years. FluMist® adds an option for vaccinating healthy persons aged 5-49 years who want to avoid influenza and are not close contacts of immunocompromised persons.

Influenza Deaths. Communicable and Environmental Disease Services section (CEDS) has received a number of calls with questions or information regarding influenza-related deaths. The Centers for Disease Control and Prevention estimates that 36,000 Americans die every year from influenza, which would lead one to estimate that 700-900 Tennesseans die in an average year from influenza. Though these situations are tragic, they are unfortunately not unusual. Most (but not all) influenza-related deaths occur in high-risk persons. Tennessee, like most states, does not have a formal system for real-time reporting or monitoring of individual influenza-related deaths. Though Tennessee definitely started out with an early influenza season, to date, we have not been experiencing an unusually severe influenza season. There have not been clusters of large numbers of unusual deaths or complications, thus far.

Protecting Oneself. Aside from getting vaccinated, people can take several, simple steps to protect themselves and their loved ones from influenza. Good respiratory hygiene and cough etiquette should be encouraged, including hand washing, and staying at home when symptomatic with fever and respiratory illness. Antiviral medications with specific activity against influenza viruses are available. These should be considered either for treatment or chemoprophylaxis for influenza, especially in persons at high risk for complications from influenza. Teach children the same healthy habits. Cover the nose and mouth when coughing and sneezing, preferably with facial tissue or the arm, not the hands. Promptly discard used facial tissues. Fortunately, it appears that the "flu season" for this year is dissipating.

Prevnar®: Attacking One Racial Disparity in Tennessee

Many measures of disease and disability differ significantly by race and ethnicity. For example, from 1999-2001 in Tennessee, the average annual percentage rate of very low-birth weight infants born to white mothers per 100,000 was 1.26; for blacks that same number was 3.22. From 1998-2000 in Tennessee, the average annual infant mortality rate for white infants was 6.4; for black infants that number was 15.6. In Tennessee, from 1998-2000, the age-adjusted death rate per 100,000 for whites was 950.0; for blacks that number was 1,259.3.[1]

Invasive Pneumococcal Disease and Race. Race and ethnicity also heighten one's risk of acquiring invasive pneumococcal disease (IPD): blacks, Native Alaskans, and Native Americans are all at increased risk for acquiring IPD when compared with whites.[2] Because IPD is the leading cause of meningitis, otitis media, and pneumonia in hospitalized patients and because it is the leading cause of bacteremia, the disease is a significant physical, social, and economic burden for individuals and families who are already at risk for other health problems.

ABCs and Antibiotic Resistance. The Active Bacterial Core Surveillance Program (ABCs), one of the elements of the Centers for Disease Control and Prevention's Emerging Infection Program, has been collecting data on invasive disease caused by *Streptococcus pneumoniae* since 1995 in Tennessee's four major metropolitan areas. Complicating the burden of disease and incidence rates of IPD, ABCs has documented an alarming increase in drug resistance to many commonly used antibiotics in the four largest counties under surveillance from 1995-2001. In some regions of

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[1] USDHHS. Health, United States, 2003. September, 2003.

[2] Robinson KA, Baughman W, Rothrock G, et al. Epidemiology of invasive *Streptococcus pneumoniae* infections in the United States, 1995-1998: Opportunities for prevention in the conjugate vaccine era. *JAMA* 2001;285:1729-35.

Prevnar®: Attacking One Racial Disparity in Tennessee (continued)

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Tennessee, over 50% of the pnemococcal isolates are penicillin-non-susceptible.

The Introduction of Prevnar©. In 2000, a 7-valent conjugate polysaccharide vaccine (Prevnar®) containing pneumococcal serotypes commonly associated with invasive and antibiotic-nonsusceptible strains of *S. pneumoniae,* was approved for routine use in healthy children younger than two years of age and older children with certain high-risk conditions such as sickle cell disease or chronic heart and lung disease. After two years, surveillance reports indicated a dramatic reduction in the incidence of IPD **(Figure)**.

The Impact of Prevnar® on Disease. Thomas R. Talbot, MD, is an Infectious Diseases Fellow from Vanderbilt University School of Medicine, working with Communicable and Environmental Disease Services (CEDS). He analyzed ABCs data for the years 1995-2002 with the goal of determining the effect of Prevnar® on racial differences in IPD in Tennessee.

During the time period under study, a total of 4,319 cases of IPD were detected in the five surveillance counties of Tennessee. Mean age of the cases was 41.7 years with 20% (n= 865) of cases occurring in children younger than age 2 years. Of the total, 55% were male; 54% (2311) were white and 44% (1887) were black.

As expected, Talbot found that whites had a lower incidence of invasive disease when compared with blacks in the years prior to vaccine licensure. In children younger than two years, the rate of IPD in both whites and blacks peaked in 1999, with a sharp decline in rates in both races following the introduction of the conjugate vaccine in 2000. Among whites, there was a 75.8% decrease to 39.6 per 100,000 in 2002; among blacks there was an 83.1% decrease to 57.4 per 100,000 ($p<0.001$ for both trends). In 2002, the incidence rate of disease in blacks less than two years was no longer significantly different than the rate in whites ($p=0.31$).

However, the findings were different in persons two years and older. Rates of IPD in whites and blacks both declined following vaccine introduction. In whites, incidence rates declined by 22.2% from 1999 to 2002 to 14.0 per 100,000; among blacks, there was a 29.6% decrease from 1999 to 2002 to 23.1 per 100,000 ($p<0.01$ for both trends). The result is that though there were declines in both groups, the rate in blacks age two years and older remained significantly higher than that seen in whites ($p<0.001$).

Conclusions. Since the introduction of the conjugate pneumococcal vaccine in Tennessee in 2000, the epidemiology of IPD has changed: racial differences in the rates of IPD for children under the age of two years have decreased. This change has been evident in children at high risk (i.e. those with chronic disease) as well as among those in lower risk groups. However, in children over two years of age as well as adults, the incidence of the disease remains significantly higher for blacks.

Talbot's data provide reinforcement that conjugate pneumococcal vaccine has a positive impact on groups both at high and low risk. It is exciting and gratifying to know that at least one racial disparity in a group that is considered the most vulnerable, black infants is being overcome.